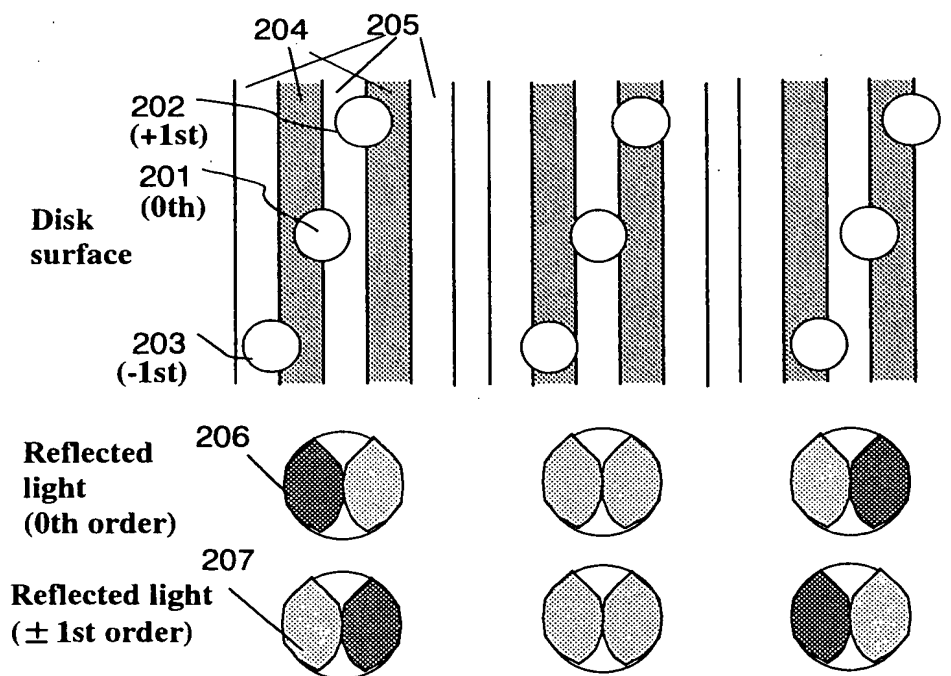


**Fig. 1**



**Fig. 2**

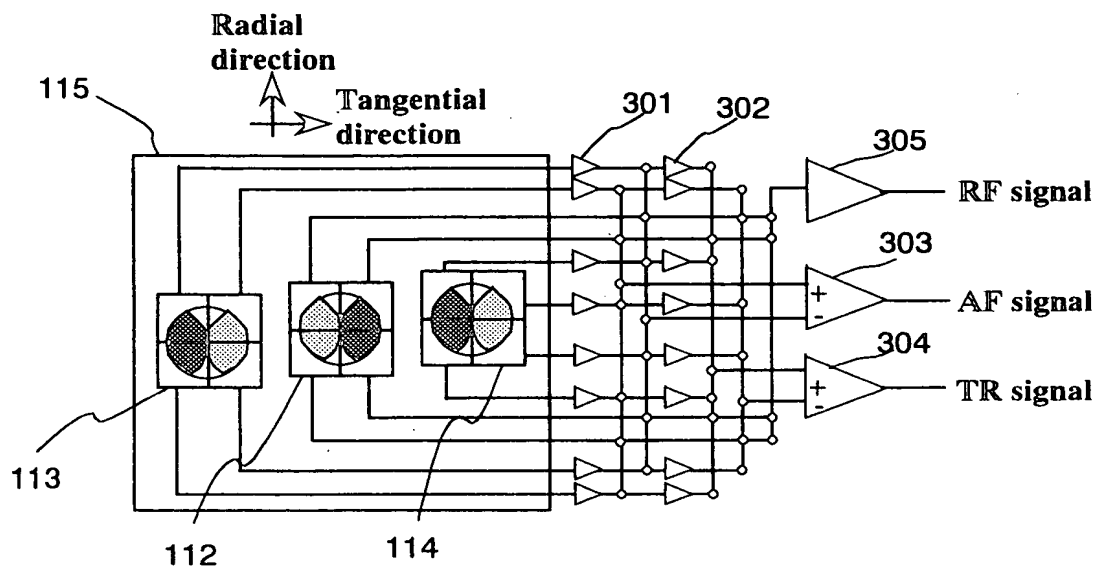


Fig. 3

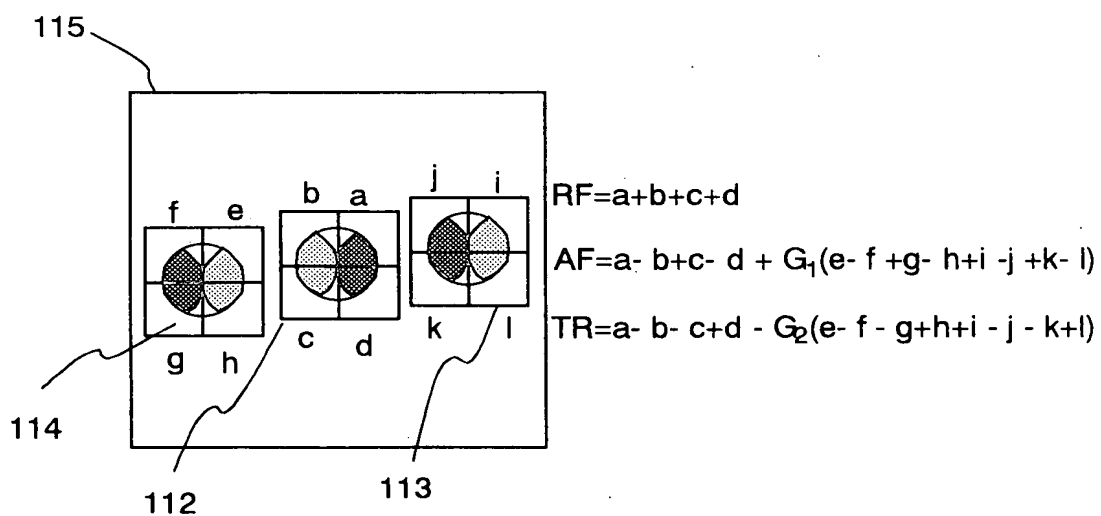
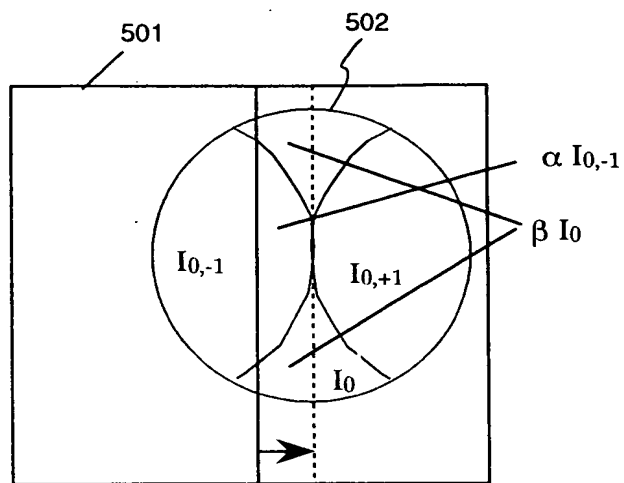
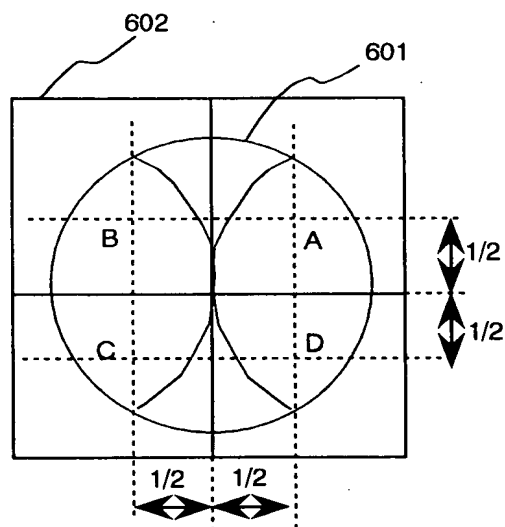


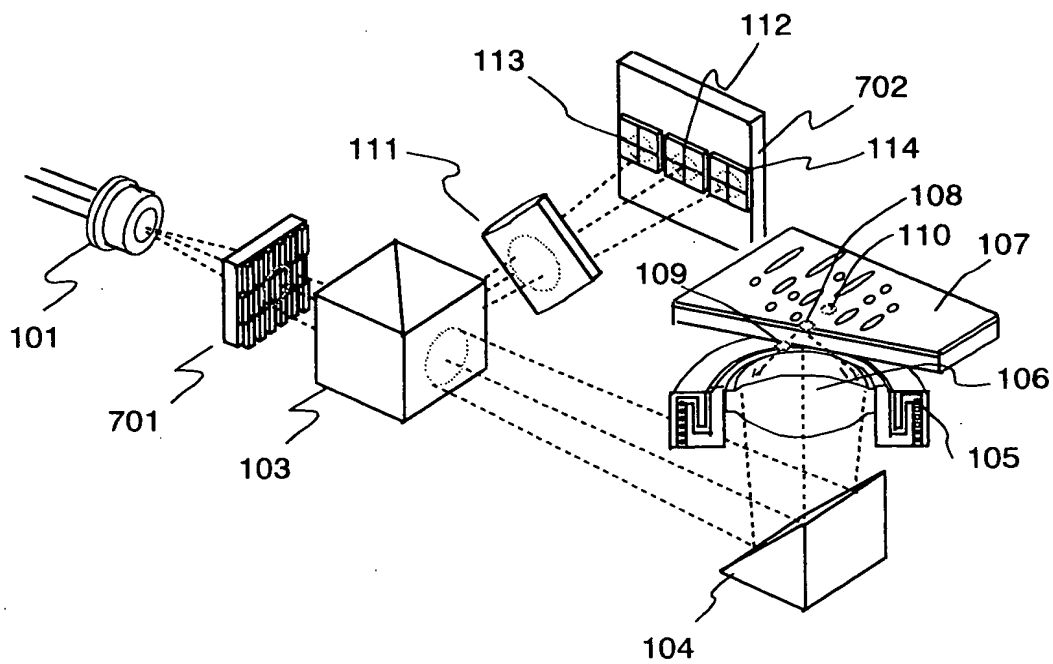
Fig. 4



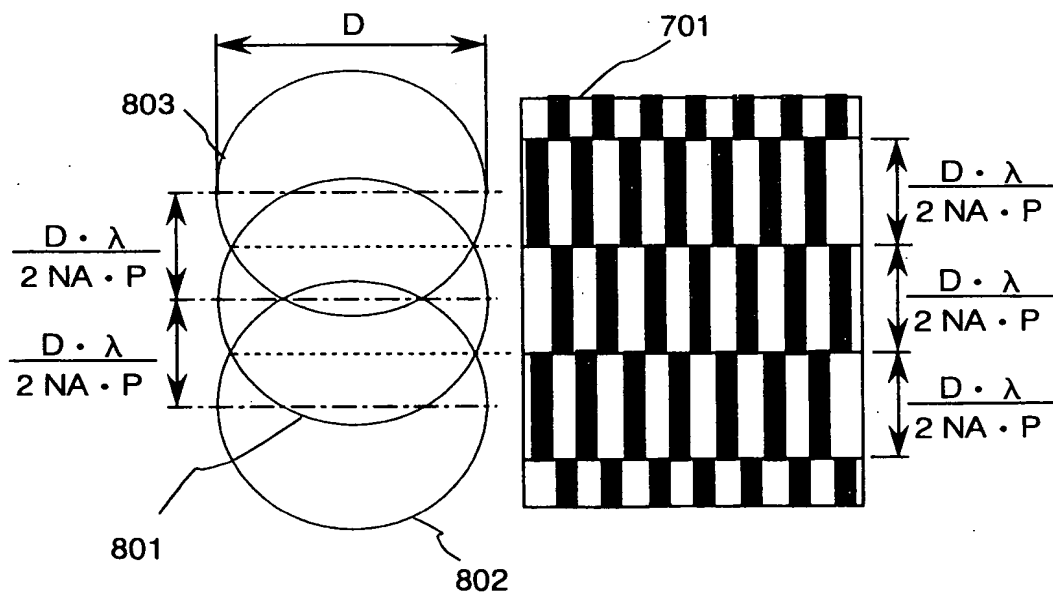
**Fig. 5**



**Fig. 6**



**Fig. 7**



**Fig.8**

FIG. 9

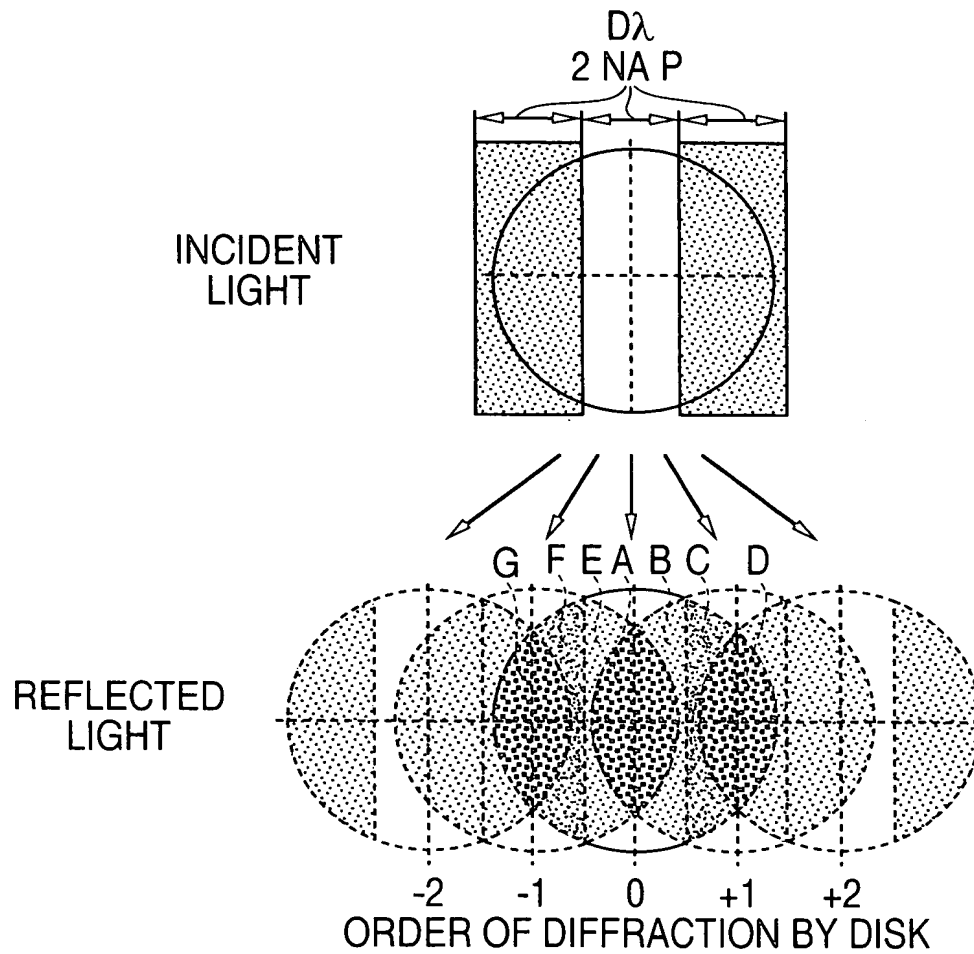
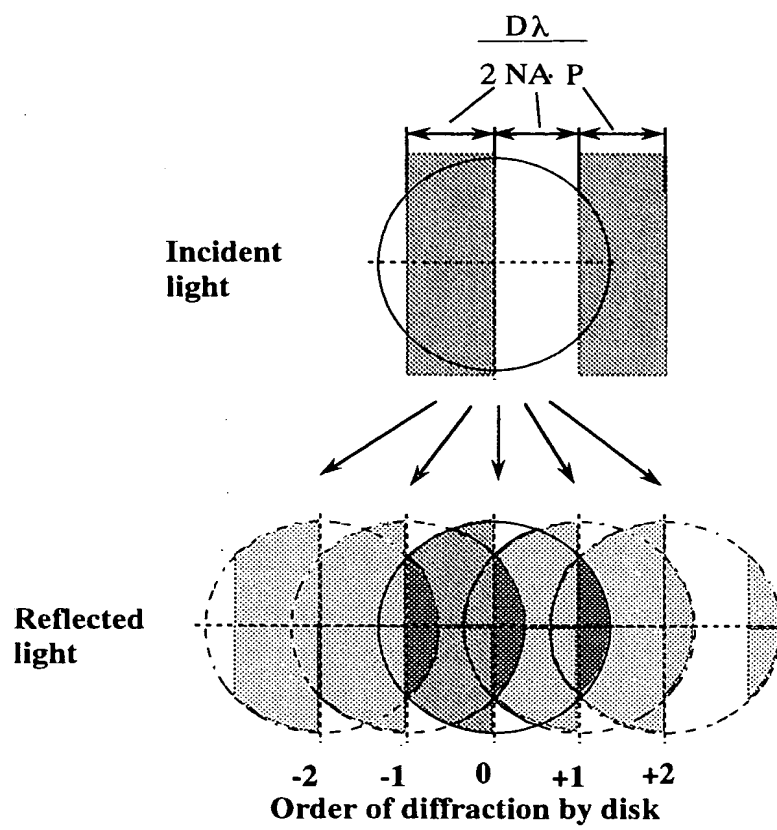


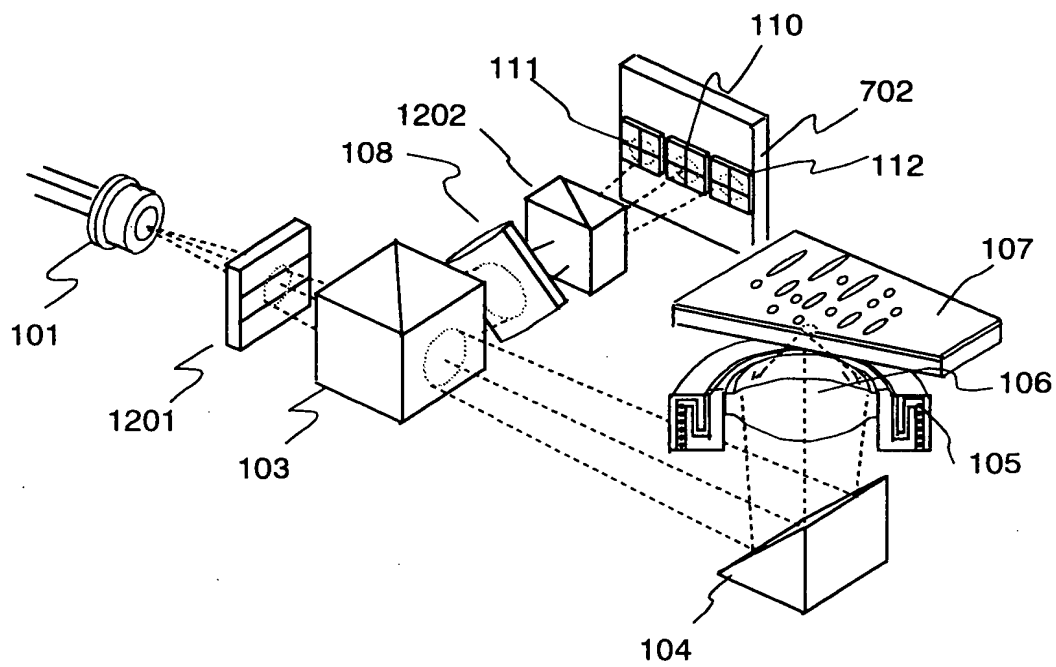
FIG. 10

CHANGES OF PHASE DIFFERENCE OF INTERFERENCE BY PHASE FILTER

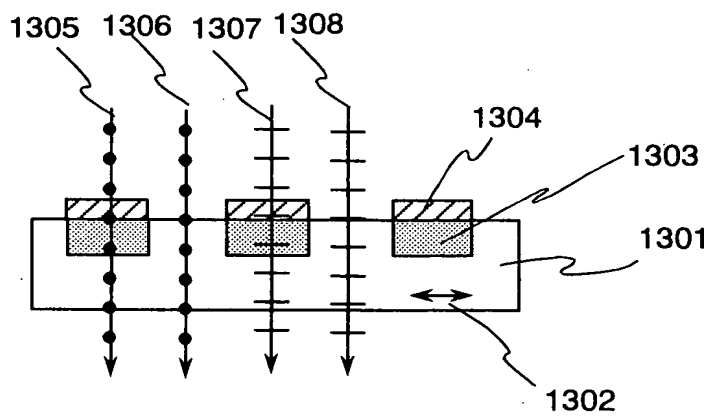
INTERFERRING DIFFRACTION ORDER		REGION						
		a	b	c	d	e	f	g
0	-2	-	-	-	-	-	-	0
	-1	$\pi$	-	-	-	$\pi$	$\pi$	$\pi$
	1	$\pi$	$\pi$	$\pi$	$\pi$	-	-	-
	2	-	-	-	0	-	-	-
-1	-2	-	-	-	-	-	-	$\pi$
	1	0	-	-	-	-	-	-
1	2	-	-	-	$\pi$	-	-	-



**Fig. 11**



**Fig. 12**



**Fig. 13**

FIG. 14

NA:0.6, WAVELENGTH:0.66  $\mu\text{m}$ , TRACK PITCH:1.48  $\mu\text{m}$   
 DISK:LAND AND GROOVE, ASTIGMATISM:0.2 $\lambda$  (-45°),  
 SPHERICAL ABERRATION:-0.47 $\lambda$ ,  
 DETECTOR DEVIATION:5  $\mu\text{m}$ (DISK RADIAL DIRECTION)  
 FOCAL LENGTH OF DETECTION LENS:22.5mm,  
 ASTIGMATIC DISTANCE IN DETECTION OPTICS:0.9mm

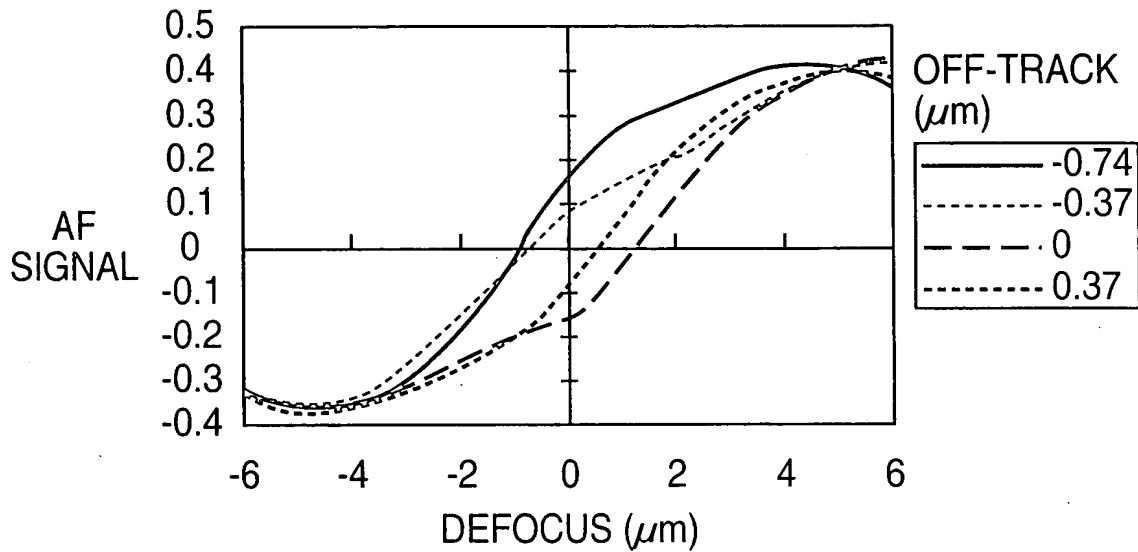
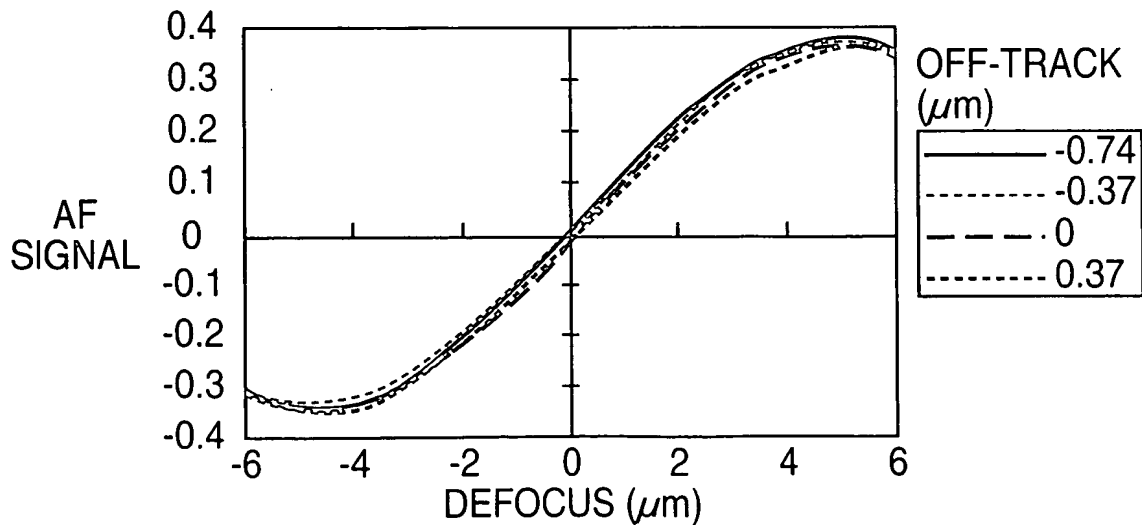


FIG. 15





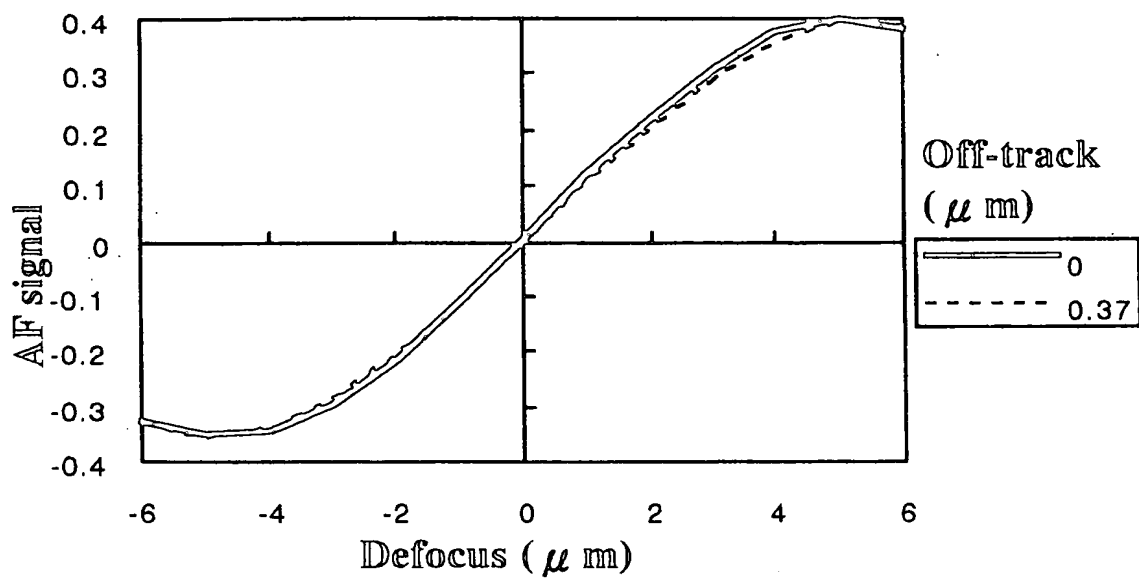


Fig. 16

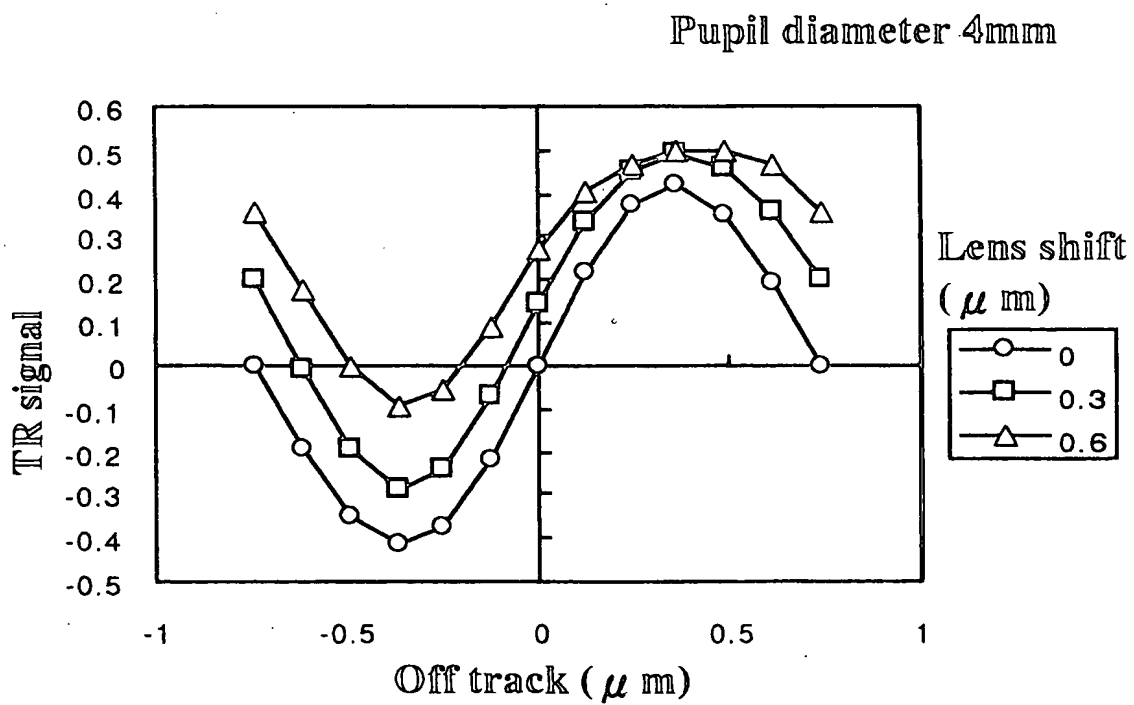


Fig. 17

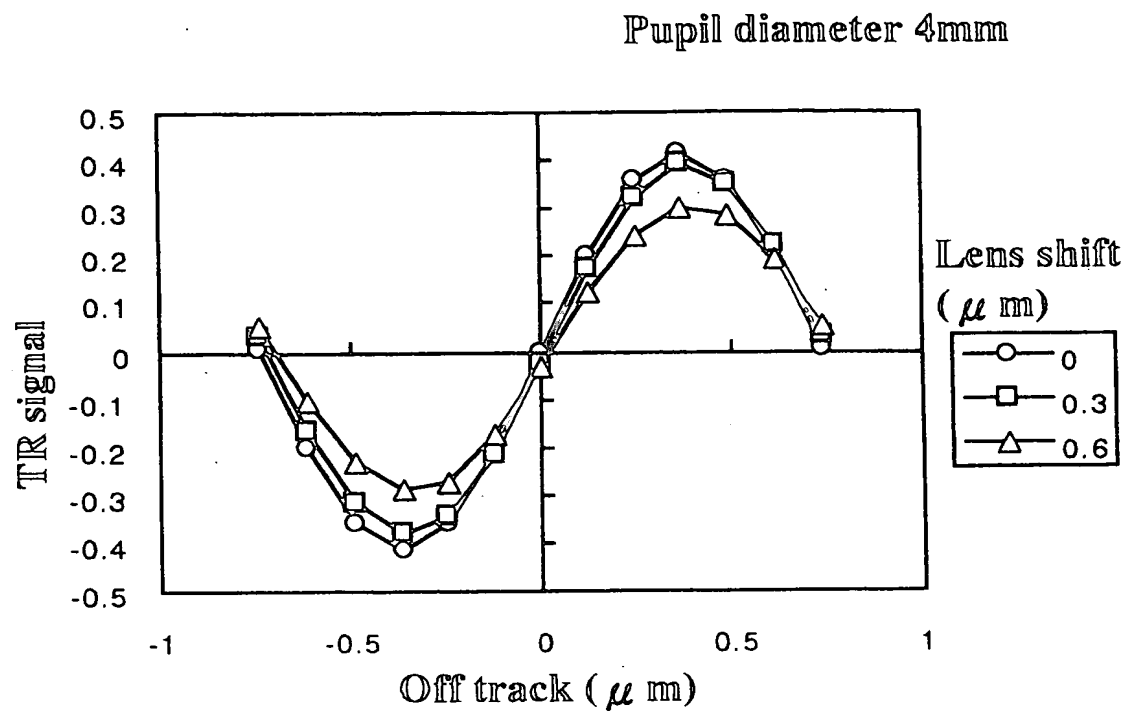


Fig. 18

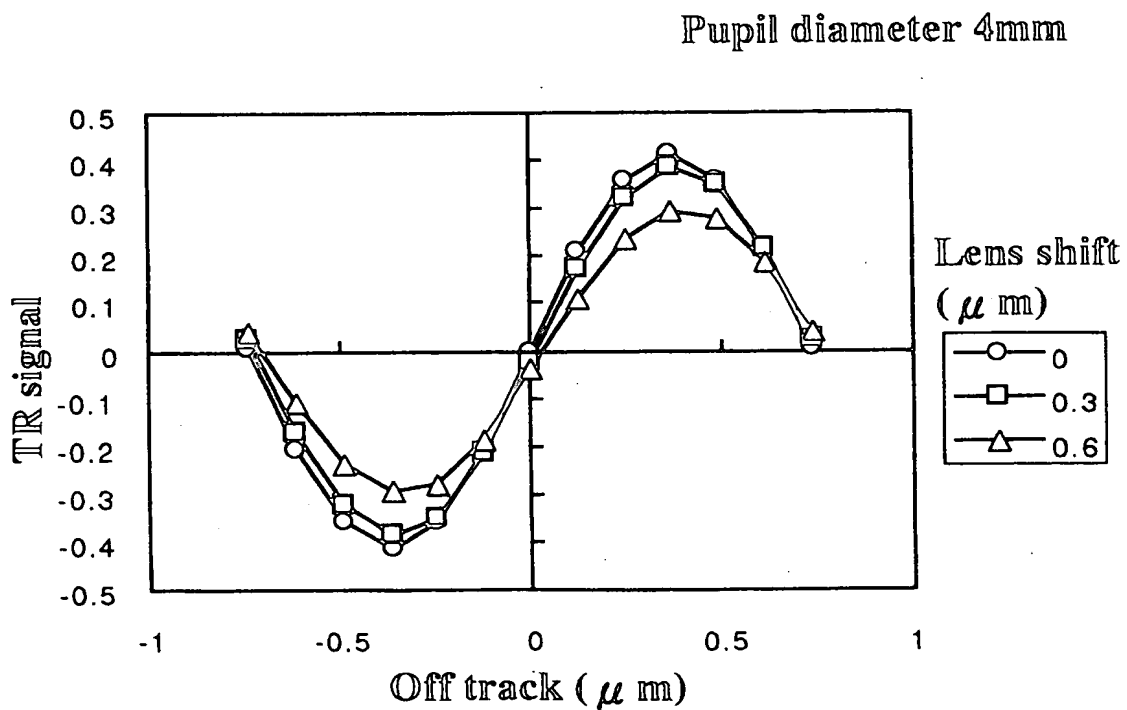


Fig. 19

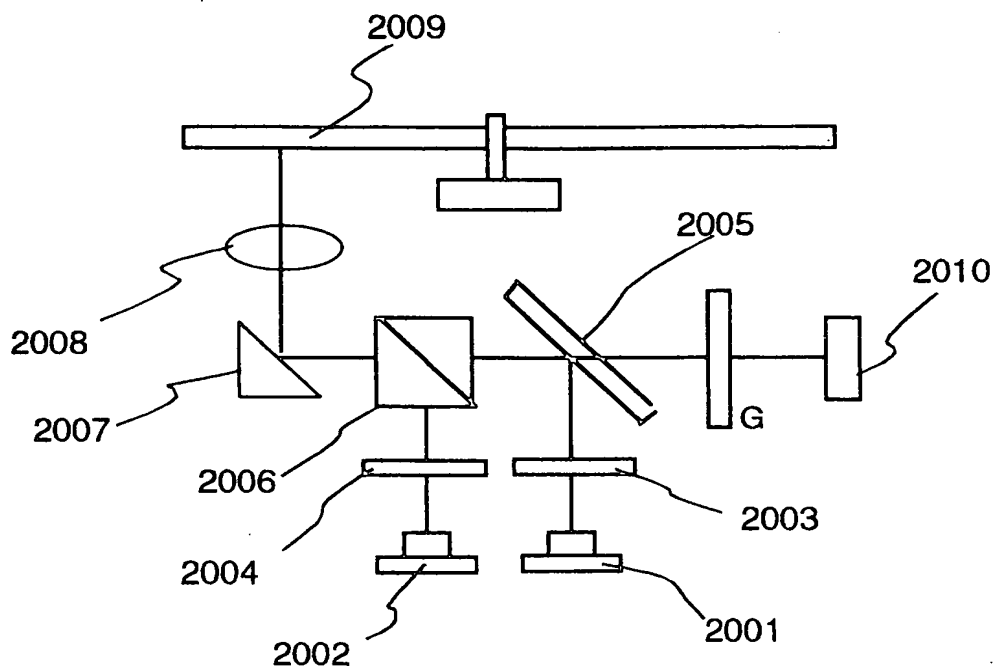


Fig. 20

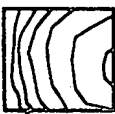
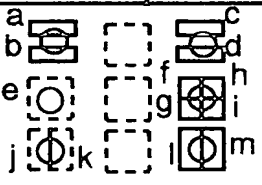
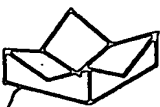
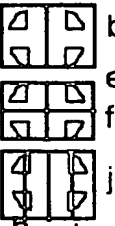
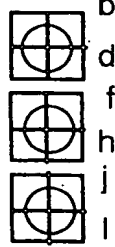
AF signal	G (in Fig.20)	Detector pattern	Operation method
Beam size detection	 2101	 Front focus      Back focus	$AF = a + b - c - d$ $PP = f + g - h - i - \alpha (l + m)$ $DPD = f + i - h - g$ $RF = e + f + g + h + i$ $3S-TR = c + d - l - m$ $(\alpha : \text{constant})$
Double knife edge	 2102	 Front focus      Back focus	$AF = g - h - i + j$ $PP = \alpha (a - b) - (c + d - e - f)$ $DPD = c - d - e + f$ $RF = c + d + e + f$ $3S-TR = a + b - g - h - i - j$ $(\alpha : \text{constant})$
Astigmatism	No	 Front focus      Back focus	$AF = e + h - f - g + a + d - b - c$ $PP = \alpha (a + b - c - d) - (e + f - g - h)$ $DPD = e + h - f - g$ $RF = e + f + g + h$ $3S-TR = a + b + c + d - i - j - k - l$ $(\alpha : \text{constant})$

Fig. 21

FIG. 22

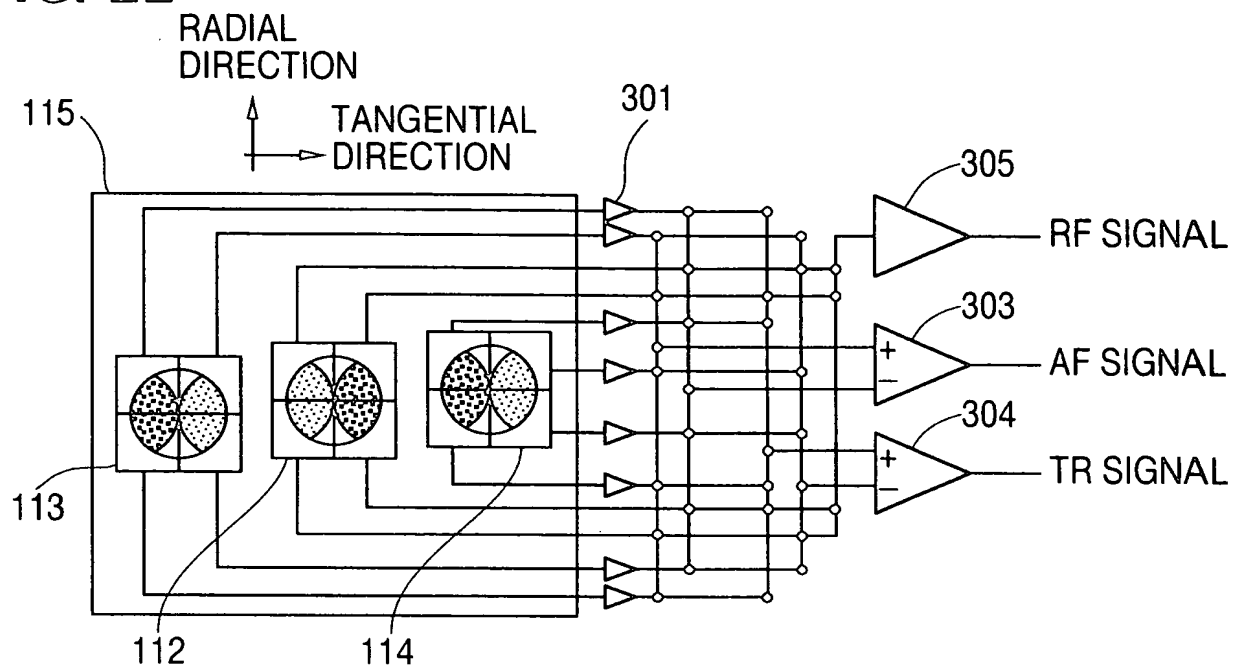


FIG. 23

